

What is claimed is:

1. A micro switch, comprising:
  - a substrate;
  - a dielectric layer formed on the substrate, the dielectric layer having a movement region formed of a predetermined portion of the dielectric layer that is capable of moving up and down by hinge parts formed on either side of the movement region;
  - a conductive layer formed on a predetermined portion of the movement region;
  - a dielectric film formed on the conductive layer;
  - first and second electric conductors formed a predetermined distance above the dielectric film;
  - two lower electrodes formed on the movement region; and
  - two upper electrodes formed a predetermined distance above the two lower electrodes, the two upper electrodes moving the conductive layer and the dielectric film upwards when an electrostatic force occurs in the lower electrodes, and capacitively coupled with the first and second electric conductors to allow a current signal to flow between the first and second electric conductors.

2. The micro switch as claimed in claim 1, wherein a portion of the substrate positioned under the movement region, a portion of the dielectric layer surrounding the movement region except where the hinge parts are formed, and a portion of the substrate positioned under a portion of the dielectric layer surrounding the movement region, are selectively etched to provide an etched region for allowing the movement region to move up and down.

3. The micro switch as claimed in claim 1, wherein the lower electrodes are respectively formed between the conductive layer and the hinge parts.

4. The micro switch as claimed in claim 1, further comprising anchors respectively supporting the electric conductors and the upper electrodes, and signal terminals applying signals to the electric conductors.

5. The micro switch as claimed in claim 4, wherein any of the conductive layer, the electric conductors, the lower electrodes, the upper electrodes, the anchors and the signal terminals is formed of one, or a combination of more than one selected from the group consisting of Au, Ag, Cu, Pt and Rd.

6. A micro switch, comprising:

- a substrate;
- a dielectric layer formed on the substrate, the dielectric layer having a movement region formed of a predetermined portion of the dielectric layer that is capable of moving up and down by a hinge part formed on one side of the movement region;
- a conductive layer formed on a predetermined portion of the movement region;
- a dielectric film formed on the conductive layer;
- first and second electric conductors formed a predetermined distance above the dielectric film;
- a lower electrode formed on the movement region; and
- an upper electrode formed a predetermined distance above the lower electrode, the upper electrode causing the conductive layer and the dielectric film to move upwards when an electrostatic force occurs in the lower electrode, and capacitively coupled with the first and second electric conductors to allow a current signal to flow between the first and second electric conductors.

7. The micro switch as claimed in claim 6, wherein a portion of the substrate positioned under the movement region, a portion of the dielectric layer surrounding the movement region except where the hinge part is formed, and a portion of the substrate positioned under a portion of the dielectric layer surrounding the movement region, are selectively etched to provide an etched region for allowing the movement region to move up and down.

8. The micro switch as claimed in claim 6, wherein the lower electrode is formed between the conductive layer and the hinge part.

9. The micro switch as claimed in claim 6, further comprising anchors respectively supporting the electric conductors and the upper electrode, and signal terminals applying signals to the electric conductors.

10. The micro switch as claimed in claim 9, wherein any of the conductive layer, the electric conductors, the lower electrode, the upper electrode, the anchors and the signal terminals is formed of one, or a combination of more than one selected from the group consisting of Au, Ag, Cu, Pt and Rd.

11. A micro switch, comprising:

a substrate;

a dielectric layer formed on the substrate, the dielectric layer having a movement region formed of a predetermined portion of the dielectric layer that is capable of moving up and down by a hinge part formed on one side of the movement region;

a conductive layer formed on a predetermined portion of the movement region;

a dielectric film formed on the conductive layer;

first and second electric conductors formed a predetermined distance above the dielectric film; and

a piezoelectric layer formed on the movement region, causing the conductive layer to move upwards by the supply of a predetermined voltage, and resistively coupled with the first and second electric conductors to allow an electric current to flow between the first and second electric conductors.

12. The micro switch as claimed in claim 11, wherein a portion of the substrate positioned under the movement region, a portion of the dielectric layer surrounding the movement region except where the hinge part is formed, and a portion of the substrate positioned under a portion of the dielectric layer surrounding the movement region, are selectively etched to provide an etched region for allowing the movement region to move up and down.

13. The micro switch as claimed in claim 11, wherein the piezoelectric layer is formed between the conductive layer and the hinge part.

14. The micro switch as claimed in claim 11, further comprising anchors respectively supporting the electric conductors, signal terminals applying signals to the electric conductors, and piezoelectric electrode terminals applying a voltage to the piezoelectric layer.

15. The micro switch as claimed in claim 14, wherein any of the conductive layer, the electric conductors, the anchors, the signal terminals and the piezoelectric electrode terminals is formed of one, or a combination of more than one selected from the group consisting of Au, Ag, Cu, Pt and Rd.

16. A micro switch, comprising:

a substrate;

a dielectric layer formed on the substrate, the dielectric layer having a movement region formed of a predetermined portion of the dielectric layer that is capable of moving up and down by hinge parts formed on either side of the movement region;

a conductive layer formed on a predetermined portion of the movement region;

first and second electric conductors formed a predetermined distance above the conductive layer;

two lower electrodes formed on the movement region; and

two upper electrodes formed a predetermined distance above the lower electrodes, the upper electrodes causing the conductive layer to move upwards when an electrostatic force occurs between the upper electrodes and the lower electrodes, and resistively coupled with the first and second electric conductors to allow a current signal to flow between the first and second electric conductors.

17. The micro switch as claimed in claim 16, wherein a portion of the substrate positioned under the movement region, a portion of the dielectric layer at both sides of the movement region, and a portion of the substrate positioned under a portion of the dielectric layer surrounding the movement region, are selectively etched to provide an etched region for allowing the movement region to move up and down.

18. The micro switch as claimed in claim 16, wherein the lower electrodes are respectively formed between the conductive layer and the hinge parts at both sides of the conductive layer.

19. The micro switch as claimed in claim 16, further comprising anchors respectively supporting the electric conductors, and signal terminals applying signals to the electric conductors.

20. The micro switch as claimed in claim 16, wherein any of the conductive layer, the electric conductors, the lower electrodes, the upper electrodes, the anchors and the signal terminals is formed of one, or a combination of more than one selected from the group consisting of Au, Ag, Cu, Pt and Rd.

21. A micro switch, comprising:

    a substrate;

    a dielectric layer formed on the substrate, the dielectric layer having a movement region formed of a predetermined portion of the dielectric layer that is capable of moving up and down by a hinge part formed on one side of the movement region;

    a conductive layer formed on a predetermined portion of the movement region;

    first and second electric conductors formed a predetermined distance above the conductive layer;

    a lower electrode formed on the movement region; and

    an upper electrode formed a predetermined distance above the movement region, causing the conductive layer to move upwards when an electrostatic force is occurred between the lower electrode, and resistively coupled with the first and second electric conductors to allow a current signal to flow between the first and second electric conductors.

22. The micro switch as claimed in claim 21, wherein a portion of the substrate positioned under the movement region, a portion of the dielectric layer surrounding the movement region except where the hinge part is formed, and a portion of the substrate positioned under a portion of the dielectric layer surrounding the movement region, are selectively etched to provide an etched region for allowing the movement region to move up and down.

23. The micro switch as claimed in claim 21, wherein the lower electrode is formed between the conductive layer and the hinge part.

24. The micro switch as claimed in claim 21, further comprising anchors respectively supporting the electric conductors and the upper electrode, and signal terminals applying signals to the electric conductors.

25. The micro switch as claimed in claim 24, wherein any of the conductive layer, the electric conductors, the lower electrode, the upper electrode, the anchors and the signal terminals is formed of one, or a combination of more than one selected from the group consisting of Au, Ag, Cu, Pt and Rd.

26. A micro switch, comprising:

a substrate;

a dielectric layer formed on the substrate, the dielectric layer having a movement region formed of a predetermined portion of the dielectric layer that is capable of moving up and down by a hinge part formed on one side of the movement region;

a conductive layer formed on a predetermined portion of the movement region;

first and second electric conductors formed a predetermined distance above the conductive layer; and

a piezoelectric layer formed on the movement region, causing the conductive layer to move upwards by the supply of a predetermined voltage, and resistively coupled with the first and second electric conductors to allow a current signal to flow between the first and second electric conductors.

27. The micro switch as claimed in claim 26, wherein a portion of the substrate positioned under the movement region, a portion of the dielectric layer surrounding the movement region except where the hinge part is formed, and a portion of the substrate positioned under a portion of the dielectric layer surrounding the movement region, are selectively etched to provide an etched region for allowing the movement region to move up and down.

28. The micro switch as claimed in claim 26, wherein the piezoelectric layer is formed between the conductive layer and the hinge part.

29. The micro switch as claimed in claim 26, further comprising anchors respectively supporting the electric conductors, signal terminals applying signals to the electric conductors, and piezoelectric electrode terminals applying a voltage to the piezoelectric layer.

30. The micro switch as claimed in claim 29, wherein any of the conductive layer, the electric conductors, the anchors, the signal terminals and the piezoelectric electrode terminals is formed of one, or a combination of more than one selected from the group consisting of Au, Ag, Cu, Pt and Rd.